1. (Currently Amended) A method for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI"), comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information,

wherein the asymmetric spin echo sequence is applied by shifting a refocusing pulse that is applied to the sample, and a first time between a rotation pulse that is applied to the sample and the refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant information.

2. (Original) The method of claim 1, wherein the spin echo sequences include an Asymmetric Dual Spin Echo Sequence (ADSE) having multiple echoes.

3. (Original) The method of claim 1, wherein the spin echo sequences include an Echo Planar Imaging-Asymmetric Dual Spin Echo Sequence (EPI-ADSE) having multiple echoes.

Claim 4 (Cancelled).

5.(Currently Amended) A ~~The~~ method ~~of claim 1~~ for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI"), comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information, ~~wherein the asymmetric spin echo sequence is applied by shifting obtaining of the resultant information~~ wherein a first time between a rotation pulse that is applied to the sample and the refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant information.

6. (Currently Amended) A ~~The~~ method ~~of claim 1~~ for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI"), comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information, wherein the MFC is determined as a function of the resultant information by applying the formula

$$K[(2n-1)\Delta t] \approx \frac{(-1)^{n+1}}{2\gamma^2 t_s^2} \ln\left[\frac{S_n(0)S_{n-1}(t_s)}{S_n(t_s)S_{n-1}(0)}\right],$$

wherein γ is the proton gyromagnetic ratio, S_n is the signal intensity of the nth echo; $t_s = |t_1 - t_2|$, where t1 is the time between a rotation pulse that is applied to the sample and a refocusing pulse that is applied to the sample and t2 is the time between the refocusing pulse and obtaining the resultant information.

7. (Original) The method of claim 1, further comprising generating an image as a function of the determined MFC.

8. (Original) The method of claim 1, further comprising determining a distribution of a paramagnetic element in the sample as a function of the determined MFC.

9. (Original) The method of claim 1, further comprising determining a distribution of iron in the sample as a function of the determined MFC.

10. (Original) The method of claim 1, further comprising adding a contrast agent to the sample prior to applying the spin echo sequences.

11. (Original) The method of claim 10, wherein the contrast agent is gadopentetate dimeglumine ("Gd-DTPA").

12. (Original) The method of claim 1, further comprising classifying a tumor in the sample.

13. (Currently Amended) A system for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI") comprising:

a storage medium, wherein the storage medium includes software that is capable of being executed to perform ~~steps~~ <u>procedures</u> comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information,

wherein the asymmetric spin echo sequence is applied by shifting a refocusing pulse that is applied to the sample, and a first time between a rotation pulse that is applied to the sample and the refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant information.

Claims 14-24 (Cancelled).

25. (Currently Amended) A software arrangement which, when executed on a processing device, configures the processing device to measure a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI") comprising a set of instructions which when executed by the processing device, performs ~~steps~~ ~~comprising~~ the following procedures:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information,

wherein the asymmetric spin echo sequence is applied by shifting a refocusing pulse that is applied to the sample, and a first time between a rotation pulse that is

applied to the sample and the refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant information.

Claims 26-36 (Cancelled).

37. (Currently Amended) A method for obtaining a magnetic field correlation ("MFC") of a sample, comprising:

applying two or more magnetic resonance imaging sequences to a predetermined region of the sample at a plurality of points in time to produce resultant data; and

determining the MFC as a function of at least one set of molecules provided in the sample and the resultant data,

wherein the magnetic resonance imaging sequences are applied by shifting a refocusing pulse that is applied to the sample, and a first time between a rotation pulse that is applied to the sample and the refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant data.

38. (Previously Presented) The method according to claim 37, wherein the molecules include at least one of water molecules or fluorine molecules.

39. (Previously Presented) The method according to claim 37, wherein the magnetic resonance imaging sequences include spin echo sequences.

40. (New) The method of claim 1, wherein the rotation pulse is a 90 degree radio frequency ("RF") excitation pulse.

41. (New) The method of claim 1, wherein the refocusing pulse is a 180 degree radio frequency ("RF") pulse.

42. (New) The method of claim 5, wherein the asymmetric spin echo sequence is applied by shifting a refocusing pulse that is applied to the sample.

43. (New) A system for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI") comprising:

a storage medium, wherein the storage medium includes software that is capable of being executed to perform procedures comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information,

wherein a first time between a rotation pulse that is applied to the sample and a refocusing pulse is not equal to a second time between the refocusing pulse and obtaining the resultant information.

44. (New) A system for obtaining a magnetic field correlation ("MFC") of a sample using magnetic resonance imaging ("MRI") comprising:

a storage medium, wherein the storage medium includes software that is capable of being executed to perform procedures comprising:

applying two or more spin echo sequences to the sample to obtain a resultant information, wherein at least one spin echo sequence is an asymmetric spin echo sequence; and

determining the MFC as a function of the resultant information,

wherein the MFC is determined as a function of the resultant information by applying the formula

$$K[(2n-1)\Delta t] \approx \frac{(-1)^{n+1}}{2\gamma^2 t_s^2} \ln\left[\frac{S_n(0)S_{n-1}(t_s)}{S_n(t_s)S_{n-1}(0)}\right],$$

wherein γ is the proton gyromagnetic ratio, S_n is the signal intensity of the nth echo; $t_s = |t_1 - t_2|$, where t_1 is the time between a rotation pulse that is applied to the sample and a refocusing pulse that is applied to the sample and t_2 is the time between the refocusing pulse and obtaining the resultant information.

45. (New) The system of claim 13, wherein the software is capable of being executed to further perform determining a distribution of a paramagnetic element in the sample as a function of the determined MFC.

46. (New) The system of claim 13, wherein the software is capable of being executed to further perform adding a contrast agent to the sample prior to applying the spin echo sequences.

47. (New) The system of claim 13, wherein at least one of (i) the rotation pulse is a 90 degree radio frequency ("RF") excitation pulse or (ii) the refocusing pulse is a 180 degree radio frequency ("RF") pulse.

48. (New) The software arrangement of claim 25, wherein the processing arrangement is further configured, when executing the instructions, to determine a distribution of a paramagnetic element in the sample as a function of the determined MFC.

49. (New) The software arrangement of claim 25, wherein the processing arrangement is further configured, when executing the instructions, to add a contrast agent to the sample prior to applying the spin echo sequences.

50. (New) The software arrangement of claim 25, wherein at least one of (i) the rotation pulse is a 90 degree radio frequency ("RF") excitation pulse or (ii) the refocusing pulse is a 180 degree radio frequency ("RF") pulse.

51. (New) The method according to claim 39, wherein the spin echo sequences include at least one of (i) an Asymmetric Dual Spin Echo Sequence (ADSE) having multiple echoes or (ii) an Echo Planar Imaging-Asymmetric Dual Spin Echo Sequence (EPI-ADSE) having multiple echoes.